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Industry and sustainable development

Report of the Secretary-General

Addendum

Industry and economic development*

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* The present addendum was prepared by the United Nations Industrial Development Organization, in accordance with arrangements agreed to by the Inter-Agency Committee on Sustainable Development; it is the result of consultation and information exchange between United Nations agencies, international organizations, interested government agencies and a range of other institutions and individuals.

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I. Role of industry in development strategies

1. Although the economic development of all major economies during the present century is largely the result of industrialization, especially the expansion of manufacturing and trade in manufactured goods, the developmental impact of manufacturing is not limited to the production of material goods: through its human resources, organizational and infrastructure requirements, the manufacturing sector has become the major force behind the creation of modern society.

2. Thus, the development of other sectors of the economy – that is, primary activities, services, education, utilities and physical infrastructure – necessarily complements manufacturing growth, although the manufacturing sector continues to be the major catalyst of technological, economic and social transformation in most countries, even if in terms of direct employment effects the services sector – and in developing countries agriculture – are often more important.

3. The challenge for the future is to maximize the impact of manufacturing on development – which includes raising living standards through more and especially better jobs – while minimizing the impact of production and consumption on the natural environment.

4. The role of manufacturing in development strategies is characterized by spatial, temporal and structural differences. In developed economies, there has been a shift away from labour-intensive mass production to technologically advanced and highly specialized industries since the 1970s. At the same time, organizational and technological developments have stimulated flexibility and the growth of small and medium-scale industries (SMIs). But although traditional branches, such as textiles, have suffered heavily in the process, there has also been a differentiation within branches, with shifts towards high value added in certain product areas. This partly explains why an activity like food processing retains a comparatively strong position in developed economies. Characterizing a country's industrial structure by referring to the relative weight of branches in the manufacturing sector is made even more difficult by the widespread internationalization of manufacturing activities: strictly speaking, many products can no longer be defined as coming from one particular country.

5. Changes in industrial structure are not just the result of market forces: they are often encouraged actively by Governments – through, for example, technology policies, large defence orders and special programmes for small enterprise – even though direct government involvement (in the form of factory ownership) and a dirigiste attitude towards particular industries are now largely a thing of the past. Generally, industrial policy in recent years has become a matter of targeting policy instruments and resources on the removal of market deficiencies hampering private enterprise. In this area, Governments are increasingly becoming facilitators and catalysts.

6. Manufacturing, with a heavy focus on capital goods, was very much the leading sector in the economic strategies of the former centrally planned economies, and the achievement of development targets was entrusted to very large enterprises that were in turn controlled by line ministries. Support services were mainly of a technical nature and an integrated part of the industrial conglomerates; management and marketing skills were not developed. Since the sector was not exposed to competition, product quality and diversity, flexibility and efficient resource use received little attention, especially in the consumer goods sector. All of which has made it very difficult for the sector to cope with economic liberalization. Privatization, restructuring and making the best of a well developed technological and human resource base are crucial elements in the recovery strategy of these countries.

7. In the absence of a strong modern domestic entrepreneurial class, and sometimes inspired by the industrialization drive of the centrally planned economies, developing countries have in the past often relied on large government-owned manufacturing enterprises to spearhead industrial development. The dominant strategy of most developing countries has long been based on inward-looking import substitution for a protected market, which has proved ineffective in creating dynamic economies and has not resulted in major reductions in poverty and unemployment levels. Such problems have been particularly pronounced in sub-Saharan Africa, where very little of the environment that would have made the emergence of a modern manufacturing sector possible was in place when the countries of the region became independent; in most cases, post-independence development strategies have been incapable of significantly improving the situation.

8. But developing countries have been rethinking the role of manufacturing in their development strategy. From the 1970s onwards, developing countries (mostly Asian, with a number in Latin America and some in Africa) have successfully used their low wage levels and abundant labour supply to attract labour-intensive foreign industries relocating from high-wage countries and re-exporting to global markets. Starting with traditional industries, such as

textiles, these soon included electronics and car assembly. Complemented by a proactive government attitude towards human resource and technology development, the latter have served as a basis for a progressive increase in technological sophistication and competitiveness in export markets of the manufacturing industries of a number of Asian and Latin American countries. In addition, SMIs have received a strong boost, especially in Asian countries, with the active support of government, helping to spread employment and business opportunities widely; working conditions and environmental management, however, have often been neglected and are major challenges for the sector.

9. With some exceptions, the countries of sub-Saharan Africa have lagged behind in this trend. A major problem for these countries is that as manufacturers, they are latecomers and find themselves in a global economy in which low-cost labour and natural resources are also offered by countries with a stronger industrial tradition. Moreover, these production factors no longer play the key role that they had in the past due to the development of new technologies and materials, the decline of raw-material-intensive manufacturing, and the growing importance of skill and technology-intensive production. Increasingly, it may be said that a country's advantages are in its human capital. Designing the strategies that will allow manufacturing to make a full contribution to the development of the region is one of the major challenges facing Governments and the business community in sub-Saharan Africa. The recent upturn in a number of sub-Saharan economies is a positive sign indicating that these countries now have an opportunity to do so.

10. Among developing countries, China is in many ways a conspicuous exception, constituting a special case: a centrally planned developing economy with a vast internal market which started an economic liberalization process well ahead of the other large transitional economies, attracting foreign investment and encouraging the development of local entrepreneurial potential through a large and rapidly expanding SMI sector.

11. Developing countries that have found the right response to trends in global manufacturing have seen their share in global manufacturing value added (MVA) rise. By 1995, the overall share of the developing countries in global MVA had reached 20 per cent, but progress has been very uneven, the main gains having been made in a number of Asian countries. In the economies in transition, a recovery is taking place, but even in the more advanced transitional economies of Central Europe, the transformation of manufacturing into an internationally competitive sector still has a long way to go and it will be some time before a process of sustained manufacturing growth sets in.

12. Data from the United Nations Industrial Development Organization (UNIDO) *Industrial Development Global Report 1997* reveal interesting trends by country group in overall and industrial development during 1970-1995. One is the trend towards recovery in the transitional economies. Another is the high growth rates (absolute and relative to gross domestic product (GDP)) of the manufacturing sectors of the East and South-East Asian countries (excluding Japan). During 1994-1996, China showed double-digit growth in MVA, while the other countries in the region had MVA growth rates consistently exceeding 7 per cent.

13. The Asian region as a whole shows growth rates of GDP and MVA well exceeding those of other country groups. A considerable part of manufacturing growth, moreover, is in industries with a high technology content: over 20 per cent of manufacturing in China and the other East and South-East Asian countries fall into this category, according to UNIDO figures. Although levels of sophistication differ in many industries, these figures are quite comparable to those for the industrialized and transitional economies. In most years and most country groups, MVA growth figures are higher than those for GDP, indicating that manufacturing continues to be the major dynamic factor in economic development.

14. In sub-Saharan Africa, recent years have seen an economic recovery in a number of countries, with Malawi, Equatorial Guinea, Uganda and Lesotho leading the way with double-digit growth rates in 1995. This could mean a new start for the industrial sector in a number of sub-Saharan countries, provided that the recovery is sustained and that efforts to create the conditions for the emergence of a competitive manufacturing sector are stepped up. Some relocation of industries from Mauritius and South Africa to other countries in the region with lower labour costs has taken place.

II. Policy challenges for Governments

15. Effective policy-making requires a dialogue between the Government, the business community and other major players in society. Increasingly, in developed market economies as well as transitional and developing economies, this dialogue not only takes place at the national but also at the (subnational) regional and local levels. Assuming adequate local or regional potential, freedom of action for local or regional actors and a coherent national strategy, such

bottom-up initiatives can greatly contribute to a country's economic performance. Accommodating different concepts of and approaches to development by different actors, however, can be a major challenge.

16. This is also true for the (supranational) regional economic entities that have emerged in recent decades, some of which, such as the European Union (EU), are acquiring decision-making powers that used to be the preserve of national Governments. In addition, there is a growing number of binding multilateral agreements on trade, among other things.

17. Against the background of a much more diffuse policy-making process, the highly competitive global economy and the need to reconcile economic, social and environmental objectives forces national Governments to concentrate efforts on three interlinked policy issues that will have a major impact on manufacturing: sustainable growth, a favourable climate for domestic enterprise and foreign investors, and increasing skill levels in societies through human resource development and technology policy.

18. Sustainable development can be defined as a form of development that maintains (or increases) human well-being, while ensuring intra-generational equity and the preservation of the Earth's total capital stock of natural, human and manmade capital. Since the manufacturing sector is the major transformer of natural capital through human and manmade capital, sustainable manufacturing must be at the heart of any sustainable development strategy.

19. A sustainable industrial development strategy must accomplish three things. First, it must encourage a competitive economy, with industry producing for export as well as for the domestic market, such as through technology and investment policies. Second, it must create productive employment, particularly long-term employment for sustained increases in prosperity, such as providing training and education and lowering barriers to enterprise creation. Third, it must protect the natural environment through the efficient use of renewable and non-renewable resources, keeping resource use within the functional limits of the ecosystem, such as by providing incentives for resource conservation and national emission standards, in harmony with international standards, where relevant. Policy reforms for sustainable growth must cover all these elements in a balanced way. The formulation and implementation of the various measures will require capacity-building at the relevant government levels. Such capacity-building will also be required for the non-governmental partners in the policy-making process.

20. A policy environment that stimulates domestic private enterprise should:

(a) Shift away from intervention, protectionism and regulation towards strategies that aim to boost economy-wide competitiveness through improvements in infrastructure and education, stimulation of research and development, links with industry etc.;

(b) Facilitate the exploration of export markets and liberalize domestic markets;

(c) Make the most of a country's entrepreneurial potential, while promoting job creation and equity by facilitating local initiative and the establishment of SMIs.

21. In many developing countries and countries in transition, a major obstacle, especially for the development of the small-scale sector, is the lack of adequate financing and industrial support services. Experience with direct public-sector support in these areas has been mixed. With regard to finance, policies and regulations should aim at the creation of a sound private banking system and encourage the development of capital markets. For the small-scale sector, Government-supported credit schemes can be effective if accompanied by good performance monitoring. In addition to such schemes, efforts must be made to mobilize savings in the sector more effectively, and legislation that directly or indirectly discriminates against SMIs must be abolished. Where industrial support services cannot yet be provided by the private sector, central, regional and local governments should make a point of involving the business community for which these services are intended in the establishment and running of such services.

22. A distinctive feature of the globalization process is the strong increase in international capital flows, in particular, foreign direct investment (FDI). For developing countries and economies in transition, FDI is often the major source of new technologies, organization and management methods. Although FDI cannot be expected to take the place of domestic investment, complementarities between domestic and foreign investment can be strong. The establishment of successful joint ventures requires the presence of active and competent local partners. Subcontracting of parts and components for large foreign firms can be an important growth factor for the small and medium-scale sector. Most importantly, FDI will only have a significant multiplier effect on the domestic economy if the business environment created by the Government also fully supports the development of domestic enterprise and investment.

23. In promoting foreign investment, coordination of FDI policies with domestic investment promotion is essential. In general, fiscal incentives given to foreign investors should also be available to domestic business. A country's policy environment must also be stable to ensure confidence among both domestic entrepreneurs and foreign investors in the economy. At the same time, policy makers must be capable of responding effectively to changes in the economic environment, which among other things requires a constant dialogue with the business community. The long-term success of economic policies reforms is ensured by evenhanded treatment of different types of enterprise, a Government's commitment to its policies and its ability to keep abreast of change.

24. Empirical evidence shows a much stronger relationship between investment and industrial growth if the concept of investment is widened to include investment in human and technological capital. This is very clear when looking at high-growth Asian developing countries. The two forms of capital are linked: without a well-developed skill and knowledge base, there is no basis for a domestic technology strategy and imported technologies cannot be absorbed. Technological progress will lead in a shift of job opportunities to the higher skill categories and to support services, and policy makers should be aware of the social implications of these shifts. With regard to environmental sustainability, very cost-effective, environmentally friendly technologies have become available in many industries. The promotion of such technologies is one area in which economic, technology and environmental policy interface.

25. Recent developments in the international arena, such as rapid technological advances, new modalities of technology transfer, foreign investment and strategic partnerships, liberalization and changing approaches to intellectual property, are producing a dramatic change in the international technology market. Developing countries, in particular, often lack information on the opportunities and alternatives in this field, as well as the ability to handle the relevant issues effectively. Successful technology transfer is also inhibited by inadequate skills and industrial infrastructure. The possibility and pace of technology transfer through FDI depends to a large extent on the technical competence and learning ability of the receiving countries, which places a heavy responsibility on those who formulate technology and educational policies, and on the willingness of foreign investors to encourage higher levels of local recruitment into key technical and management positions. The availability of a large pool of highly skilled labour puts the transitional economies and some of the developing economies in a good position, provided that they create the right investment climate.

26. A comparatively new way by which the more advanced developing countries gain access to key technologies and other strategic assets is through direct investments in industrialized countries. A number of firms from the Republic of Korea and Taiwan Province of China have acquired equity stakes in innovative start-ups and spin-offs from existing firms in industrialized countries. Success in this area is partly due to the proactive role of government with regard to technological modernization and intensive collaboration with the industrial sector.

27. Least developed countries looking for technology inflows may often find it easier to attract FDI originating in developing countries than in industrialized countries. Technology transfer can take place between developing countries in order to exploit opportunities for regional cooperation, which enables them to optimize their gains from the new technologies. Such cooperation may begin with an exchange of information and later develop into commercial relationships.

28. Domestic capabilities should also be strengthened through greater cooperation between industry and domestic research and development. In this respect, there is a considerable potential in the transitional economies and a number of the larger developing economies, although the conversion of military technologies for the civil market is a major problem in some of the former. Industry and research and development can be linked in various ways, and a step-by-step approach via incubator centres, upgrading industrial estates etc. should be contemplated before costly investments are made in full-fledged science parks, although the latter will help to attract foreign high-technology firms if the overall investment climate for such firms is right. At the local or regional level, proactive government can do much to stimulate productive links between the business and academic communities.

29. In view of the increasing significance of the knowledge embodied in technologies, management methods, marketing skills, problem-solving abilities of employees etc. as a production factor, the educational system and the social infrastructure of a country more and more determine its overall competitiveness. One of the Government's main responsibilities is the provision of general basic education and sufficient opportunities for secondary and tertiary education. Good access to education is particularly important for women since their opportunities to participate have usually been inadequate. In a heavily competitive global economy, it is essential that – without exclusively focusing

on the present needs of the economy, which would limit longer-term creativity and adaptability and hence sustainable development – the knowledge and skills provided by the educational system correspond adequately to the needs of enterprises. In developing countries, the educational system usually does not produce enough graduates with relevant technical and non-technical (managerial, marketing etc.) skills; the transitional economies suffer from a lack of non-technical skills that are relevant to a market economy.

30. Consultations between the Government and the private sector can help to adapt education and training to labour market signals and to shift part of the educational burden away from the government budget. Educational legislation should allow the establishment of private-sector schools teaching business skills. Partnerships between the public and private sectors, which are becoming common in many developing countries, ensure that essential skills and theory acquired through formal education are complemented by enterprise-based practical training. The system, however, only works well with strong supervision of training institutions and if enterprises are committed to adequate investments in staff training, including programmes that keep staff abreast of changes in technology, marketing strategies etc. Again, it is important to provide equal opportunities to female staff for participation in these programmes. Tax incentives can stimulate enterprise investments in training.

III. Policy challenges for the international community

31. The Uruguay Round agreements and the establishment of the World Trade Organization (WTO) will have far-reaching repercussions on industrialization in developing countries. In joining WTO, developing countries commit themselves to the entire Uruguay Round package of trade reforms. In terms of export market prospects, the main gains to developing countries will be improved access to developed country markets and an insurance policy against future barriers to those markets. But although such gains provide opportunities to developing countries, most African and some Caribbean countries will suffer losses due to the disappearance of preferential trade arrangements. And although the overall developing country export gains are likely to be considerable – quota elimination is estimated to result in an additional $80 billion of textile and clothing exports by 2005 – much of this growth is expected to go to China and India, the implication for many other countries being a restructuring of their export activities. Tariff reductions will favour the development of downstream processing. In the short term, the most significant developing country industries to benefit will be leather and footwear, travel goods, rubber, wood and paper products, and yarns or jute.

32. The trade-related investment measures agreement under the Uruguay Round mean that local content regulations and trade-balancing tests will have to be abolished in a few years, although such measures will be temporarily allowed for infant-industry protection and balance-of-payment reasons. This has important industrial policy implications for developing countries and economies in transition. Explicit export subsidies will have to be replaced by indirect support to export oriented industries, such as through training programmes, support for research and development, and international marketing assistance. Overall improvements to the business environment, such as outward-looking trade policies, investment policies that stimulate technological capacity-building and infrastructure building, will help exporters in general. Again, working with the domestic business community is essential for designing policies that will be effective.

33. Integration agreements among developing countries, such as free trade areas or customs unions, can contribute significantly to export growth, but new approaches will be needed to avoid the disappointments of earlier agreements. For a number of European transitional economies, the recent and forthcoming agreements with individual European countries and the European Union present great opportunities, but creating a business climate that will encourage domestic producers to meet foreign competition remains a challenge for policy makers.

34. In an increasingly interdependent international economy, the globalization of communications and consumption must be complemented by effective globalization of production patterns, employment opportunities and rising incomes, without which peace and social stability will be jeopardized. These objectives cannot be left to market forces and the private sector alone, and more than ever require international cooperation through specialized institutions and networks.

35. In order to strengthen the ability of the manufacturing sectors of developing countries and economies in transition to face competition in global markets, multilateral and bilateral assistance has a role to:

(a) Support the design of strategies and policies for international competitiveness;

(b) Build up domestic capacities;

(c) Stimulate the development of individual industrial activities.

In addition, a globalizing economy will require that the multilateral organizations strengthen their role as a world forum for the debate on development issues, and for the encouragement of cooperation between the different regions and country groups.

36. In order to overcome the impediments to industrial development in Africa and in the context of the United Nations System-wide Special Initiative for Africa, UNIDO has set up the Alliance for Africa's Industrialization. Although targeted at Africa, the Alliance is also relevant to least developed countries outside the African region. In cooperation with African industry, Governments and institutions, this initiative will address three specific issues:

(a) Capacity-building for human resource development, institution-building for the private and public sectors, increasing government efficiency and socio-economic progress;

(b) The promotion of competitiveness through private-sector development, strategic alliances and investment, and innovation and upgrading of industries enjoying potential comparative advantages;

(c) The promotion of natural resource based industries in areas where individual countries have a comparative advantage.

37. The liberalization of world trade will result in a boost for world manufacturing, and raises fresh concerns about the linkages between economic growth and environmental sustainability. The rapid rise of manufacturing in a number of developing countries will require the progressive improvement of environmental policies and the transfer or development of environmentally sound technologies, which constitutes a major challenge for the international community. Dealing with the industrial pollution inherited from the era of central planning in the economies in transition is a similarly daunting international challenge.

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I. Introduction

1. Social development is a multifaceted concept involving the creation of employment, the social protection of workers, improvement of their working environment and investment in human capital. There does not have to be a trade-off between the profitability of industry, a condition of economic sustainability, and social development. Industrial development is unsustainable unless it provides adequate employment together with working conditions that respect workers' health and safety, and the environment. More positively, profitable industrial growth is one of the best ways of supporting social development. The role of the state in creating and maintaining a level playing field is essential because market forces do not provide incentives to all firms to pay attention to the social development of their workforce or of the surrounding community.

2. The relation between industry and social development is a global issue linked to the changing structure of employment both within and between regions. The International Labour Organization (ILO) *World Employment Report, 1996/97* concluded that full employment, one of the pillars of social development, remains an achievable goal. Fear of the emergence of a general phenomenon of jobless growth in countries of the Organisation for Economic Cooperation and Development (OECD) is not well founded. Nevertheless, there are intense anxieties in many quarters over the possible job-destroying effects of rapid technological change and intensified international competition. Industrial workers in OECD countries fear that globalization accelerates such changes even if it does not cause them, and reinforces them by way of the delocalization of industrial production to relatively low-wage developing countries. At the same time, while industrial workers in certain developing countries may be benefiting from new sources of employment thanks to access to global markets, the sustainability of such employment is far from guaranteed.

3. To achieve sustainable social development, it is essential to create sufficient employment of acceptable standards for all those who desire to work, which is an enormous challenge. OECD countries have experienced high rates of unemployment, informalization of production and working conditions, and increased income inequality. In other regions, the employment situation has been similarly subject to upheaval. Latin America and sub-Saharan Africa have experienced a decline of the formal manufacturing sector, increasing informalization and underemployment. Certain African countries have experienced a trend back to the agricultural sector. South Asia has shown a slow but continuous improvement of economic conditions and levels of employment; yet poverty remains high and much remains to be done to provide the population with decent employment. The recent financial crisis in South and South-East Asian countries indicates the fragility of economic development and employment growth even in those countries considered, up to now, as the most successful examples of industrial growth and development.

4. These experiences make it clear that social protection is a necessary complement to employment generation. Globalization will not be politically viable if it leads to a deterioration in social justice. Rising inequality, deteriorating labour welfare and the absence of adequate social protection could breed discontent and provoke a strong backlash against globalization.

5. Nevertheless, there are some reasons for optimism. Expansion of export-oriented manufacturing has led to increased job opportunities for women, albeit usually at a lower-than-average wage rate, but the gains made from increased access to labour markets are of great importance to enhance gender equality. Notwithstanding recent events, the experience of East and South-East Asia offers hope that poor countries can achieve rapid growth without increasing inequality, and also shows that human development, such as providing education and health care, is essential for sustainable economic growth. But there are also positive developments outside East Asia. The corporate responsibility movement is making strong headway in OECD countries, as firms find that less exploitative working conditions – better health and safety conditions, shorter working hours and more consultative management forms – can improve economic performance in many dimensions.

6. Interestingly, such initiatives are not confined to the formal sector. There are cases of small enterprises in South Asia and Africa collectively providing social protection for themselves, on their own initiative, on the clear understanding that such measures enhance the productivity of their operations. One important policy challenge is to find ways to facilitate and encourage the spread of such initiatives throughout the informal industrial sector. The potential to enhance productivity is very great in this sector, given low productivity levels in many such activities to date, and the need to do so is most pressing, not only because wages are low in the informal sector but because the great bulk of industrial employment is generated in small enterprises.

7. At the macroeconomic level, sustainable social development can only be achieved with a reasonable rate of economic growth; at the level of the firm, sustainable

improvement of working conditions can only be achieved with increases in value added, so that competitiveness is not threatened. However, the contrary is also true, that is, social development provides the foundation for and preconditions of both economic growth at the macro level and competitiveness at the level of the industrial enterprise. There are many such instances of good practices, in which social development and good economic performance go hand in hand.

II. Industry and human development

8. Social development is a precondition for competitiveness in an increasingly global economy. For example, providing basic education and health care to the majority of the population is essential for rapid development. High levels of literacy in East Asia preceded and accompanied its economic boom rather than following it. Conversely, the low levels of education in South Asia or sub-Saharan Africa have formed a barrier to growth.

9. Investment in human development, in general, provides positive returns. But improving basic education and health is not a simple strategy, especially for the poorest countries. At the same time that these measures need to be taken, increasing competition makes it harder to implement them. Although industrial development is seen to be largely the responsibility of the private sector and despite the move towards privatization of industry that accompanied many structural adjustment programmes, the State has a crucial role to play in making industry competitive.

10. Although industry is one of the engines of economic growth and employment creation, in many developing countries industrial employment and output have grown very slowly over the last two or three decades. The "tiger economies" of East and South-East Asia were the only ones to simultaneously achieve rapid growth in output, employment and real wages through industrial expansion. Some of the newly industrializing Asian economies, such as China and Indonesia, have recently benefited from a labour-absorptive pattern of growth based on expansion of industrial capacity.

11. Employment usually increases along with industrial output, but that relationship is far from fixed. Growth is in many places becoming less employment intensive: between 1975 and 1990, employment elasticity fell in 9 of the 16 economies for which it was possible to make such a comparison.[1] This trend is not limited to the richest, OECD countries: it is a cause for concern in some developing countries, such as India and Pakistan, since they display very low elasticities of employment in industry, with industrial employment increasing much more slowly than the value of output.

12. Accompanying these changes in employment have been changes in wages, including the disparities between men and women. There has been enormous divergence between regions: whereas real wages declined in only four of a sample of 20 developed countries, they declined in about half of a sample of Asian countries.[2] In other places, experiences were even less favourable: real manufacturing wages declined in 26 of 33 non-Asian developing countries. Wage disparities between men and women in manufacturing are large, with a female-to-male ratio of the order of 2 to 3, with no evidence of any general diminution of the gap. The East Asian developing countries tend to have the largest gender gap in wages, and where the wage gap is decreasing, it is declining less than proportionally to gains in women's education. But the declines in real wages may reflect the absorption of more lower-paid women into the industrial sector workforces rather than falls in existing wage levels.

13. Worry about the impact of globalization on both quantity and quality of industrial employment is justified, but it is certainly not universally true that globalization leads to an overall decline in employment. As the share of manufactures in the exports of many countries, particularly in the developing world, has increased, the resulting rise in industrial output has been accompanied by an increase in employment. However, the impact varies across regions, between and within countries and sectors.

14. Overall, in richer countries, the impact is labour-saving and employment-reducing, especially for unskilled workers. Countries with a traditional manufacturing base have tended to experience the sharpest reductions in industrial employment as a consequence of globalization. By contrast, in the East and South-East Asian countries, employment has been created at rapid rates, and in some cases full employment has been sustained for many years on this basis. Middle income countries face greater international competitiveness from lower-cost suppliers as world trade continues to be liberalized. For their industries to survive, they must expand export capacity into new, more technology-intensive product areas, where fewer but more highly skilled workers will be required. Even so, in some cases the growth of output may be sufficiently rapid to generate increases in total employment, even with reduced employment elasticities. And real wages are likely to rise in this situation. In low-income countries that have developed an export orientation, manufacturing employment in relatively labour-intensive forms of production is expanding

rapidly, which draws in far higher proportions of female labour than other types of industrial production.

15. The situation regarding the quality of employment is equally diverse. Although increasing competition stimulates increased productivity, it jeopardizes the survival and profitability of many firms, which may seek short-term cost savings by cutting back on social protection for their workers and by attenuating the nature of their contractual obligations to their workforce. Globalization often leads to cost-cutting and delocalization of once protected industries, raising also the danger of a "race to the bottom" insofar as respect for fundamental labour standards is concerned. Trade unions are confronted with a reduced ability of workers to resist such deterioration in standards.

16. Thus, globalization has introduced the possibility of deterioration in working conditions for large sections of the industrial workforce worldwide. In some places, this is already happening, as indicated by evidence of dramatic moves away from guaranteed jobs to "flexible" labour markets and the rise of non-regular forms of employment in the old industrial centres. Self-employment and part-time and temporary employment have risen markedly in all OECD countries. Some export-oriented industries in developing countries still use child and bonded labour, and ignore safety considerations. Here, however, more research is required to determine whether or not globalization actually contributes to poor working conditions and disregard of core labour standards or merely increases the international visibility of pre-existing working conditions. There is a danger, especially for women drawn into the market for cheap labour, that gains in women's labour market participation may be short-lived and not carry through when industries move to more skill-intensive production.

17. Central to the possibility of a country gaining from globalization is the fulfilment of certain conditions of social development. As indicated above, the East Asian countries provided health, education and some other social services to the population before the onset of rapid economic growth. Some countries, such as Pakistan, have acknowledged the force of this argument in deciding to reallocate state expenditures in favour of social sectors. Others, notably East Asian countries in transition from centrally planned to market systems, are finding that a historical pattern of high social spending serves them in good stead in the new global trading system.

18. Increasingly, the service sector is becoming the most important employer of labour in various parts of the world. Its growth has also been closely linked to overall increase in welfare, as well as to the globalization of the economy. Liberalization, which has begun with the inclusion of services into World Trade Organization rules under the Uruguay Round of multilateral trade negotiations, may help to increase service sector employment. The growth of the service sector has also facilitated the growth of global industrial trade, particularly as a result of innovative information technology and new forms of financial and business services.

19. Figures on the growth of service sector employment are partly a statistical illusion. Many enterprises are reducing their in-house workforces, buying services from external providers instead of hiring labour. Technological progress, particularly in telecommunications and information processing, has allowed many such services to be relocated internationally. Thus, industry remains the motor force in expansion, but with increasing linkages to services. The health of the service sector and linkages to industry are factors that help globalization to foster increased employment.

20. Much of the growth in manufacturing employment takes place in informal enterprises. In poorer countries, the informal sector forms the major part of the economy, and that sector has been growing in richer as well as in developing countries. Therefore, its productive potential should be harnessed while at the same time seeking to improve the conditions of workers. The concept of the informal sector, however, hides enormous diversity. In middle-income countries in Latin America, South Asia and the Middle East, small-scale urban industry in the informal sector is much more important relative to the formal sector than in most East Asian countries. The traditional informal sector in developing countries includes independent small producers, but sub-contracting is also common, particularly between formal and informal enterprises. These developments require new efforts to extend the protection of core labour standards to informal enterprises.

21. Informalization in the industrialized countries is often a reaction to increasing international competition, and provides a means to reduce labour costs and introduce greater flexibility, including casual and part-time employment. The result is "third-world" labour conditions, and small sweatshops employing vulnerable groups within the large cities of the United States of America and Europe, alongside increases in non-regular forms of work by established producers. In developing countries also, pressure of competitiveness is pushing producers towards atypical ways of organizing production, which in turn is leading to the informalization of employment.

22. But the informal sector also contains small companies with high skill levels and with certain comparative advantages. The greater knowledge that the informal sector may have of the local institutional context and of other complementary informal enterprises helps it to benefit from globalization. Where clusters develop or strong links are established between international firms and local small suppliers, the informal sector is more likely to be able to move to exporting and/or to act as a supplier to export-oriented industry. The greatest potential for employment growth lies with small and medium enterprises (SMEs), and policies that support informal sector enterprises with micro-credit and with improved working conditions and social protection can help them to cross the threshold to the formal sector.

III. Policy challenges for Government and business

23. Recent changes in employment worldwide, particularly related to globalization, thus provide risks as well as opportunities. To turn current challenges into advantages, policies that promote the quality as well as quantity of employment are necessary: on the one hand, there is a win-win situation, in that there are policies that promote social development and at the same time enhance productivity and competitiveness, but on the other hand, in many situations employers are unlikely to create such conditions of social development. Countries where this tendency is paramount are at serious risk of falling behind in the globalizing economy.

24. For the market to function in the long-term interest of the population, certain preconditions need to be created that will steer enterprises in this direction and facilitate the task for the state and private sectors of enhancing social development. There is increasing emphasis on the need for partnership between the State, the private sector and civil society in pursuit of this goal. A first policy challenge is to ensure sufficient employment of high quality. This presupposes sustainable economic growth. Employment creation should not compromise basic efficiency, especially in an increasingly competitive environment. For this, a supportive macroeconomic environment is essential. In addition, patterns of economic growth should be channelled towards employment-intensive forms of growth, especially in labour-surplus economies. Labour-intensive manufacturing is an option for developing countries, and it has provided jobs, especially for women, more effectively than import-substitution strategies. Economic reforms that correct for incentive biases, such as overvalued exchange rates and protection of capital intensive sectors, are likely to improve the situation. The basic infrastructure and services that support the productivity of SMEs are often inherently labour-intensive, and investments in public works infrastructure are a good way to create employment in both the infrastructure and industrial sectors.

25. According to a United Nations Industrial Development Organization (UNIDO) estimate, the informal sector typically employs three quarters of the industrial labour force in developing countries. It cannot be taken for granted that informal-sector enterprises have higher labour intensity, and substandard working conditions are a common problem. The policy and regulatory environment should enable rather than obstruct the success of SMEs through the removal of market and product barriers, and in accordance with social development objectives, should also encourage higher levels of social protection in this sector. Fiscal policy should be non-penalizing in its impact on small firms, and finance and credit policies often need specific revision to ensure that the needs of small firms for finance capital are met. Limited access to capital is commonly much more of a bottleneck for the growth of small firms than is the cost of capital. An enterprise and productivity enhancing culture can be supported by Governments in quite simple ways, such as with a system of rewards to successful innovators and firms that introduce good employment practices.

26. Another policy involves clustering that supports organizational capacity-building for collective access to services, such as market information, trading standards and marketing. The nurturing of institutional links between small firms can also provide the basis for harmonization of and improvements in social protection for member firms' workers. The ILO has given technical assistance to groupings of small enterprises in the United Republic of Tanzania and India in projects that have been successful in supporting employment security and improved labour productivity.

27. Increasing labour force participation by women should be welcomed. Barriers preventing women from entering the labour force – including high fertility, low levels of skills and education, or lack of child-care facilities – should receive attention. Virtuous circles can be created that improve women's welfare and capabilities, at the same time increasing overall economic growth.

28. Conditions of employment for women should be central to employment policy. Many discriminatory practices exist in the rapidly growing economies no less than elsewhere. Women are overrepresented in industrial sectors,

with low pay and insecure jobs, and face discrimination in relation to employment conditions and wages. Also, policies should focus on the further development of skills among the female labour force to ensure that countries have a large supply pool of skills as they graduate out of simple labour-intensive and into higher value-added, more technology-intensive production activities.

29. Agenda 21 also recognizes the role of business in achieving its objectives by working towards cleaner production and responsible entrepreneurship. The importance of increasing the efficiency of resource use, including the reuse, recycling and reduction of waste per unit of economic output, is well recognized. Employers are increasingly becoming aware of their social responsibility in achieving such objectives. The ILO programme on employers' organizations and cleaner production aims to encourage businesses to work proactively to improve environmental performance and assist them in doing so.

30. There are three ways in which business perceives its social responsibilities. According to one school of thought, the business of business is to make business. After all, enterprises pay taxes, make donations to non-governmental organizations and pay wages. But that view no longer dominates. A second common view recognizes that there are serious social problems and that business has a social role, with a responsibility to devote resources to tackling such issues as ecological degradation and unemployment. In reality, however, words and actual action differ considerably, as shown by the widespread trend towards the downsizing of the workforce.

31. A third small but rapidly growing group of enterprises sees social problems as symptoms of more fundamental issues. The strategy of these enterprises to cope with such problems is not through incremental changes in attitude of enterprises towards customers, employees and suppliers. Rather, it requires a fundamental change in business itself. Social initiatives are an essential component of the new strategy, which aims to achieve a growing convergence between the needs of society and business interests. While enterprises have always been involved in social activities, genuine new initiatives are characterized by financial support to outplacement, self-employment, employee buy-outs, business start-ups and indirect assistance to outsiders, and the financial involvement of employees in business management.

32. It is essential to integrate action on the general environment with activities on the working environment. Although it is not easy to monitor progress regarding the working environment, there is a concern that single-minded pursuit of economic growth alone in a competitive world may sometimes result in a lack of adequate safeguards on safety and environment in places of work, which may be at least partly responsible for the growing number of accidents in workplaces and an overall deterioration in the work environment in many countries. The trends that are noticeable in workplaces include increased intensity in pace of work, greater use of chemical substances and introduction of new technologies. Improving occupational safety and health, as well as more participatory management strategies, makes good business sense. More needs to be done to spread the lessons and examples of such good practices, and to provide incentives to contribute to better working conditions. Simple measures, relating to hygiene for example, may improve working conditions and efficiency. Incentives are important. For example, accident insurance can have built-in inducements to reduce the number of occupational accidents.

33. Working conditions for women should be high on the agenda. A major neglected issue is violence at the workplace; certain exposed occupations are particularly affected. Finally, adoption of legislation on issues that affect women, especially maternity rights and provisions, and night work need special attention to ensure that protection does not lead to declining access to jobs.

34. If poor countries can build their human capital resources, catch-up is possible. If early development of human capital resources does not take place, the possibility of convergence is less. Improving basic education and health is a win-win strategy, but it is not a simple strategy, especially for the poorest countries that have severe budgetary constraints. Yet countries need to prepare their population for international competition, and this is a major policy challenge for the State.

35. Many industrial enterprises are worried by the level of education of school-leavers, for example, and by the educational requirements of a flexible labour force. Better information regarding specific demands for labour, as well as the provision of schooling, can be provided by enterprises, sometimes in partnership with Governments. Again, a serious problem is that the poorer countries who need such measures most, are less likely to obtain them, either from business or the Government.

36. Over the last decades and often linked to the crisis of employment, much concern has rightly been expressed about the viability of many social security provisions, particularly in the face of growing unemployment and ageing. Furthermore, there is a danger of jobs being lost to the detriment of sectors with good social protection in favour of employers or countries that do not provide such coverage.

An opposing concern has been the limited coverage of social security, particularly in developing countries.

37. But there are also positive lessons to be learned. Unemployment benefits have successfully been restructured in some OECD countries, such as to stimulate re-entry into labour markets. The role of both business and Government in retraining workers for "employability" provides one avenue for reducing the pressure on traditional safety net programmes.

38. In poorer areas, successful social security provisions are by necessity different, but positive measures are possible. For example, the Indian Self Employed Women's Association has stressed child care as the most important measure for assuring mothers' peace of mind and improving productivity. Recent work by the ILO has attempted to introduce adapted forms of social security in the informal sector, such as in the form of collective (mutual) insurance against health costs in Dar es Salaam.

IV. Policy challenges for the international community

39. The central concern of the international community with respect to industry should be its growing international disparities. Globalization renders these inequalities more visible, and it increases countries' and groups' risks of falling deeper into poverty and exclusion. Enhancing social development worldwide is a common goal, one that will be advantageous in the long run for all concerned.

40. The World Summit for Social Development (1995) provides perhaps the strongest basis for international cooperation to eradicate poverty. Policies should build on countries' commitments expressed in the declaration, which includes the expansion of productive employment and the reduction of unemployment for those able to work, as well as the enhancement of social protection and reducing vulnerability of the poorest groups. For employment-related policies, the international community has a role to play to ensure that international trade and trade agreements do not halt the creation of employment on a world scale, and that core labour standards are adhered to, especially with respect to freedom of association, collective bargaining, abolition of child and bonded labour, and gender discrimination.

41. Adherence to the core standards and other standards related to working conditions, occupational safety and health, and social security offer promising means of social development. While encouraging the observance of these standards, international agencies should also focus on assisting countries at lower levels of development in their efforts to participate in the global economy. Although the ultimate objective is to enable these countries to be competitive in the global economy without compromising on labour standards, technical assistance may be required to help firms in low-income countries and small enterprises in all regions to attain the required standards without undercutting their competitive position.

42. The ILO programme of action against child labour, implemented in collaboration with private-sector employers and trade unions, has helped to change the climate of public opinion, persuading Governments that practical solutions to the problem of child labour are possible, and mobilizing resources internationally to address the issue. This approach also provides the lesson that multi-enterprise involvement is essential, i.e., that employers across the board must be drawn in to any sectoral programme to improve labour standards. The introduction of such improvements may carry a cost to enterprises, even if only in the short term. Only if all firms are involved and make changes at the same time can the problem of penalizing compliant firms in terms of their market share be overcome.

43. With globalization, the role of Governments, employers and trade unions is undergoing transformation. For actors in the international community, a number of options are suggested. First, the United Nations has a role in the monitoring of the progress made in following up the Copenhagen Declaration on Social Development, in conjunction with Agenda 21. Second, the ILO has a central role in monitoring the implementation of relevant labour standards, and in stimulating patterns of economic growth that provide job opportunities for all those who desire to work. Third, countries within trade blocs should consider the wider implications of trade agreements and make long-term effects in terms of employment creation and social development central not only to trade but also to investment policies. Fourth, both domestic and multinational enterprises have an interest in developing social initiatives: enhancing social development within and outside companies makes good business sense, certainly in the long run. International organizations of employers are playing a role in spreading information about and expanding these good practices. Finally, trade unions are facing an unprecedented challenge as a result of rapid technological development and globalization. They need to reorient and reorganize at both the national and international levels to confront an increasingly global economy, in which global inequalities are increasingly coming to the forefront. Also, new emphasis is being placed on reaching out to and organizing workers in the informal industrial sector. Trade unions have a vital

economic function during industrial restructuring, and continue to play an important role as vehicles of democracy and advocates of social justice, notably by reaching out to women, minorities, consumer groups, the unemployed and the growing numbers of working poor in countries round the world.

Notes

[1] See *World Employment 1996/97* (Geneva, International Labour Office, 1996), p. 151.

[2] See A. Amsden and R. Van der Hoeven, "Manufacturing output, employment and real wages in the 1980s: labour's loss until century's end", *Journal of Development Studies*, vol. 32 (1996), No. 4, pp. 506-530.

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Industry and sustainable development

Report of the Secretary-General

Addendum

Industry and environmental protection*

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I. Introduction

1. Business and industry play a crucial role in the economic and social development of countries. The production of industrial goods and services involves the extraction of natural resources, their utilization in the manufacture of products, the disposal of waste, and the distribution, use and disposal (including reuse and recycling) of the final product. Environmental impacts can occur with varying degrees of risk along this entire industrial life cycle, and appear as local, regional, transboundary and/or global environmental problems. Many industrial processes are themselves hazardous and can result in serious accidents with harmful effects to human health and the environment.

2. Although industry is a major user of natural resources and a direct or indirect source of pollution and other environmental impacts, business and industry must remain a key partner in the common endeavour to achieve sustainable development. Business and industry have the technology, know-how, resources and the entrepreneurial spirit to innovate, which can be used to achieve environmental goals and objectives.

3. The environmental impacts of industrial activities are relatively well known, and appropriate responses to these impacts continue to be discussed in a number of international and national forums. What is now crucial is the urgency for action. Although both industry and Governments have responded considerably to the challenges legitimized at the 1992 United Nations Conference on Environment and Development, the response remains localized, particularly in multinational corporations and developed country Governments. What is now required is a concerted effort by the international community to encourage all Governments and industries – both large and small – to respond and to act.

II. Industry's impact on the environment

4. The main environmental impacts of industrial activities are becoming better known and understood, and an assessment of these impacts leads to a number of key conclusions that need to be taken into account when developing and implementing responses to them. It is increasingly evident that the environmental consequences of industrial emissions and discharges to specific media (air, land, water etc.) are interrelated and rarely localized in one medium. Unfortunately, many policies currently being implemented by Governments are medium specific and can lead to the transfer of pollution from one medium to another. Consequently, there is a need for an integrated, holistic approach to environmental policy.

5. In addition, the scale of environmental impacts is increasing. In particular, the time lag between emission, impact and ultimate environmental or health consequences is becoming longer. Although environmental impacts can be most evident at a local and/or regional level, the environmental problems stemming from industrial activity are influencing the global environment and therefore require global solutions. There is also an increasing dispersion of environmental contaminants, which may lead to long lasting impacts that are often not well known or understood.

6. Many Governments, particularly in developed countries, have adequate systems in place to monitor air and/or water quality. However, in addition to monitoring emissions, there is now an urgent need for Governments to also monitor the consumption of natural resources by industry and to correlate the consumption of natural resources with environmental degradation.

III. Policy challenges for government and industry

7. The role of Governments is to provide leadership through an integrated policy approach and regulatory framework that sets clear environmental goals and objectives for business and industry. Governments also play a crucial role in monitoring environmental quality and the environmental performance of business and industry to ensure that these goals and objectives are being met. To facilitate a smooth transition towards sustainable development, Governments, together with local authorities, must design an appropriate enabling framework. The establishment of national environment/sustainable development strategies called for in Agenda 21 provide the opportunity to design such frameworks.

8. Although national environmental policy plans (NEPP) need to reflect national priorities, experience has shown that successful national environmental policy plans are designed through the following policy cycle: planning (setting environmental goals and objectives); implementation (regulations, market mechanisms); monitoring (of implementation of plans, environmental quality and industry environmental performance); and corrective action.

9. A number of planning tools, such as strategic impact assessment and environmental technology assessment, are currently used by national Governments to help support the

development and application of environmentally sound technologies, risk assessment for the environmentally sound management of chemicals, environmentally sound siting and planning of industrial activities, and monitoring and state-of-the-environment reporting. The planning (siting and zoning) of industrial activities to avoid or minimize environmental impacts has been weak or non-existent in many countries. In addition, the integration of environmental considerations into the design of various public services, such as transport, energy and infrastructure development, is needed.

10. Environmental impact assessments (EIAs) are widespread and their increased use has improved environmental sensitivity in decision-making at the enterprise level. However, EIAs are not always used effectively, mainly due to a lack of baseline data, little provision for cumulative and synergistic assessment of impacts from a number of sources, and a general lack of monitoring. In addition, conclusions drawn from EIAs are often not taken into account in the decision-making process, nor are EIAs used in conjunction with other planning tools, such as risk assessment and contingency planning.

11. Industrial polices set within the NEPP framework should include an integrated approach to environmental management that focuses on prevention rather than cure, and extends producer responsibility to encourage the practice of shared responsibility for the environmental impact of products among the designers, suppliers, manufacturers, distributors, users and disposers of those products.

12. Most countries have designed regulatory frameworks to control industrial operations by setting emissions standards. These command-and-control regulations have been used with varying degrees of success. In particular, expertise and institutional capacity for the development, implementation and enforcement of environmental regulations are weak in many countries. Furthermore, there is often an unclear division of responsibilities among government authorities. Recent experience demonstrates that the environmental performance of industry can best be improved by a judicious mix of instruments, including incentives as well as restrictions, that facilitate innovation and complement economic policies. The continuing liberalization of trade will also require Governments to further develop and implement appropriate regulatory frameworks.

13. Environmental regulations and the corresponding compliance and enforcement schemes have often been designed to tackle a single-medium problem, such as solid waste, water or air pollution, and fail to recognize that pollutants move from one medium to another. Emission standards with short-term objectives also tend to encourage end-of-pipe controls, such as treatment plants, filters and scrubbers, leading to the transfer of pollutants between media as well as high investment costs, with no economic payback. Integrated approaches and the setting of long-term quantifiable goals rather than prescribing specific technologies can encourage the adoption of cleaner technologies and preventative measures in industrial facilities.

14. Economic instruments, such as taxes, levies and other fiscal instruments, are increasingly being applied by Governments worldwide. However, few economic incentives, if any, have actually replaced regulations, because most have been introduced with the primary objective of increasing government revenues rather than altering behaviour towards more environmentally sound activities. Taxes, for example, are usually not set high enough to internalize environmental externalities, and therefore do not make the "polluter pay". Although some progress has been made, pricing policies still need to be dramatically reformed so that environmental externalities are internalized and producers, transporters and consumers of various commodities face the full environmental costs of their activities and ultimately reorient their consumption patterns. Some subsidies artificially lower prices for natural resources, which are then often used profligately, creating both pollution and shortages. The environmental impacts of subsidies need to be studied further and appropriate steps should be taken.

15. Currently, most national accounts fail to include many activities that entail environmental modifications or the use of natural resources with potential environmental impacts. Alternative national accounts, which could measure the total use of natural resources that national economic activity requires, would support policies that encourage the efficient use of natural resources, and would lower material requirements and environmental impacts throughout the materials cycle.

16. Voluntary programmes are a relatively new environmental policy instrument, pioneered by such countries as the Netherlands, Canada and Germany. Voluntary programmes to mitigate energy-related carbon dioxide (CO_2) emissions have been implemented or are being developed in many nations in the Organisation for Economic Cooperation and Development(OECD). They can take many forms, and are best combined with other policy instruments. For example, voluntary codes of conduct can aim to facilitate and accelerate research and development. At the other end of the spectrum, negotiated agreements are often designed to reach numerical targets and/or specific

performance goals. Market-based trade between electric utilities, notably in the United States of America, of CO_2 reductions for sulfur dioxide allowances has reduced both acid rain and greenhouse gas emissions. More flexible, voluntary approaches to environmental regulation need to be explored within NEPPs. In particular, the benefits and feasibility of tradable permit programmes should be further explored.

17. Monitoring of the environmental performance of industry is an ongoing challenge in most countries. Some success has been reached through state-of-the-environment reporting and toxic release inventory types of reporting. It is also important to extend such efforts to include industry's consumption of natural resources, and to correlate the consumption of natural resources with environmental degradation, which will ultimately require the development of national indicators with which to benchmark the environmental performance of industry.

18. Many industries in all regions of the world lack the appropriate information, expertise and know-how to improve their environmental performance. Governments can support the shift to cleaner eco-efficient industries through a variety of support measures. For example, green procurement policies and eco-labelling programmes can stimulate the market for greener products. Governments can provide information and technical/managerial advice to industry, and can support locally relevant investment in research and development. Educational curricula in engineering and business programmes should incorporate the prevention approach, and training programmes for business and industry leaders on environmental management need to be developed and/or supported. Governments can also develop innovative financing programmes to improve and facilitate access to capital for small businesses and communities so that they can more easily invest in cleaner, more eco-efficient practices. Measures should also be taken to facilitate the transfer of technology and managerial know-how between one industrial sector and another, and between large and small companies.

19. Government regulations and – increasingly – public pressure have been the initial drivers in pushing business and industry to address environmental issues. Many companies now recognize the importance of environmental issues, and transnational corporations, in particular, have started to realize the competitive advantage of reducing environmental impact while creating economic value. However, the scale of change required to move from "business as usual" to sustainable development will require a well articulated vision of what the sustainable enterprise should be, which will require leadership and innovation for the business community as a whole.

20. The technology response of business and industry to environmental issues has been developed at three main levels: (a) treatment technologies, aimed at reducing emissions and waste after they have occurred (end-of-pipe); (b) recycling wastes back into the production process; and, (c) cleaner production and eco-efficiency through the prevention of pollution and waste generation at the source of production (preventive approach). Business and industry has made considerable progress in developing new technologies, in particular monitoring and information technologies. However, the long-term, indirect and unanticipated effects of new technologies have often been overlooked.

21. Waste is increasingly being treated as a raw material and less as something to be disposed of. For example, scrap steel in tonnage terms is the world's most recycled material. Through recycling, the steel industry extracts less natural iron-bearing ores, saves energy and reduces CO_2 emissions. However, recycling of steel can also be very energy intensive. In the pulp and paper industry, for example, a study found that recycling processes use less energy than virgin pulp based ones but generally rely more on fossil fuels, with the result that greenhouse gas emissions could increase with higher levels of recycling.[1] Clearly, recycling is a feasible option in some industry sectors; however, it is not the panacea for all environmental problems.

22. Cleaner and safer technologies and strategies that aim to prevent emissions and waste at source can also reduce environmental impacts over the entire product life cycle from materials extraction to final disposal. Depending on the market price of raw materials and local treatment costs, such an approach can also result in significant economic savings, as well as environmental benefits. Hence, the term eco-efficiency is also being used to define this approach.

23. Clearly, there is also a need to substantially increase the resource productivity of raw material use. The ultimate expression of this trend will be a shift within corporate management from a product-focused strategy to a service-focused strategy that satisfies the same consumer demand. A demand-side strategy will also need to be further developed with industry in order to delink people's needs (and satisfaction) from the consumption of natural resources. This will require consumption patterns to change, moving from quantity (consume more) to quality (consume differently).

24. The search for innovative and cost-effective ways to improve industry's environmental performance has also led

to the development of a wide array of environmental management tools. Such tools can be used by companies and Governments to direct industry towards environmental improvements and cleaner production. The large environmental management system (EMS) "toolbox" now includes specific tools that enable companies to: (a) assess and evaluate the environmental impacts of their processes, products and operations (for example, cleaner production assessment and EIAs); (b) manage their environmental aspects (such as eco-design and eco-labelling); (c) communicate with their stakeholders, such as environmental reporting and supply chain management; and (d) monitor their progress and compare it with that of other companies (for example, benchmarking, and environmental performance indicators). New environmental management tools, such as environmental accounting, in which the price of goods and services reflect real environmental costs, will need to be developed and widely implemented by business and industry. In addition, verifiable and enforceable performance goals will need to be set in consultation with stakeholders.

25. Industry sectors that have not yet incorporated the environmental dimension into their daily operations will need to be encouraged to do so. The consulting service sector, for example, is just beginning to integrate environmental concerns into their decision-making process. This sector, which often acts as the "prescriber" of good practice, has a crucial role in ensuring a sustainable, preventative approach is implemented in the management practices of companies worldwide.

26. In 1996, the International Organization for Standardization (ISO) published an EMS standard (ISO 14001). As of November 1997, more than 2,000 companies worldwide had obtained ISO 14001 certification. These standards can bring important benefits for companies since an EMS can be a useful tool to increase resource efficiency and achieve savings. Several countries are taking a proactive approach to ISO 14001, and are promoting its implementation at the national level. It is essential that ISO 14001 certifying organizers are properly trained and are mutually recognized around the world.

27. There are, however, a number of barriers to implementing an EMS. For example, the costs of implementing an EMS may be higher for companies in developing countries than for their competitors in developed countries. Small and medium-sized enterprises (SMEs) in both developing and developed countries have little awareness of EMS and the corresponding ISO standards; in most countries, few SMEs have access to appropriate training and assistance. There is also concern that to the extent that ISO 14001 certification becomes a de facto condition for doing business, it may act as a non-tariff barrier to trade for developing countries if conformance with the standard is costly or difficult to achieve for companies in developing countries.

28. Government regulations have been the initial driver in industry's response to environmental issues. There is, however, a growing trend among a variety of stakeholders to hold companies accountable and responsible for the environmental impacts of their operations and products throughout their entire life cycle. Many stakeholders are further demanding greater transparency from industry. Financial institutions, for example, have begun to demonstrate an interest in the environmental strategies of companies, and are increasingly demanding standardized information to evaluate company risk and performance. Some banks, insurers and equity markets believe that sound environmental management leads to risk reduction, which is valued by financial markets. This is an encouraging development which should be supported and further encouraged.

29. Industry, primarily through industry associations, responded to the growing demands of stakeholders by developing voluntary codes of conduct, charters and codes of practice. Agenda 21 endorses this voluntary approach, and encourages business and industry to use such codes to promote best environmental practice. Examples include the International Chamber of Commerce business charter for sustainable development and the chemical industries' responsible care initiative. Many stakeholders, however, remain unconvinced about the results achieved from such codes of conduct since they are rarely monitored and/or enforced. Effective monitoring and follow-up programmes need to be developed to ensure that codes of conduct do not remain just words on paper.

30. Some companies, in particular multinational companies from industrialized countries, have begun to voluntarily disclose information on their environmental activities and emissions through company environmental reports (CERs). Before 1990, CERs were rare, but each year the number and quality of such reports is increasing. One of the major benefits to companies of the CER is that it serves as a powerful force for internal organizational change, and is also increasingly seen by companies as a means to greater accountability and not an end in itself. But although company environmental reporting has improved considerably in the past eight years, significant challenges remain. For example, CERs rarely detail the operations of multinational companies in developing countries, nor is the reporting practice widespread. A limited number of national

industry associations report the aggregate environmental performance of their member companies. This sector-wide environmental reporting is a positive step and should be encouraged.

31. There appears to be a growing trend for companies to have their CERs externally verified. Such external verification needs to be increasingly undertaken in order for CERs to be deemed credible by stakeholders. In addition, reporting frameworks will need to be standardized without constraining innovations in reporting. This will ultimately require the development of common indicators and metrics from which to measure the environmental performance of business and industry. These indicators should be developed in a transparent consultative process involving stakeholders and taking into account current efforts to develop macro sustainable development indicators.

32. A number of companies have also begun to work in partnership with their stakeholders to realize common environmental goals. The aim of most of these partnerships has been to move from positions of confrontation to positions of mutually agreed and understood interdependence. Despite an increasing acceptance of their value, the awareness and experience of cross-sector partnerships remains limited. Although anecdotal evidence of their benefits is growing, there is still much to learn on how to structure, manage and replicate them, and there is also a need to understand their limitations.

IV. International policy responses and challenges

33. The solutions required for global environmental problems cannot only be taken by sovereign nations or industry alone. Shifting the global economy onto a sustainable path requires an unprecedented degree of international cooperation. The international community provides an ongoing, multi-stakeholder platform to discuss current priority issues, and contributes to building knowledge and expertise to help decision makers in all sectors of society make environmentally informed choices.

34. Regular assessments of resource consumption, emissions and implementation of policies are required to guide rational and effective decision-making for environmental policy formulation, implementation and evaluation. Currently, however, international assessments and inventories of industrial emissions and performance data are seriously lacking. Where national inventories do exist, they are rarely harmonized and often outdated, making regional comparisons and global evaluations extremely difficult. Faced with these difficulties, a number of United Nations agencies and other bodies do report on global and regional environmental trends. The 1997 *Global Environmental Outlook*, for example, acts as an early warning system and provides an essential tool to speed up the pace of environmental action, set priorities and support informed decision-making. It is an important first step to reviewing major environmental issues from a regional perspective and evaluating policy responses that address regional priority concerns.

35. The development of cost-effective, meaningful and useful methods for the regular assessment, monitoring and review of the environmental performance of industry at the local, national, regional and global levels is urgently required. Investment should be made for new and better data collection of key environmental impacts from industrial activities, the harmonization of national databases and the acquisition of global datasets. Particular attention should be paid to aggregate assessments of each industry sector's environmental performance.

36. One of the main barriers to the adoption of cleaner, eco-efficient technologies and management tools by Governments and industry is a lack of information. Various international organizations, in particular the United Nations Environment Programme (UNEP), the United Nations Industrial Development Organization (UNIDO) and the United Nations Conference on Trade and Development, have been striving to eliminate this barrier by providing practical and easy-to-use materials and by facilitating information exchange. These activities have met with success and should be further supported.

37. A number of programmes have been set up to increase worldwide awareness of the preventive strategy embodied in cleaner production, and to help government and industry develop programmes and activities that will expand the adoption of cleaner production know-how and management approaches. In particular, nine UNEP/UNIDO national cleaner production centres have been established to offer training and technical assistance. In addition, information is gathered and disseminated through publications (case studies and technical reports), databases, and information exchange systems, such as the UNEP International Cleaner Production Information Clearinghouse (ICPIC). These efforts need to be continued and supported.

38. To encourage greater awareness and adoption of the preventative cleaner production strategy by public and private sector societal leaders, an international declaration on cleaner production is under formulation. To be launched

at UNEP's Fifth High-Level International Seminar on Cleaner Production, to be hosted by the Government of the Republic of Korea, this declaration will be a public but non-legally binding commitment on behalf of signatories to give priority to and to monitor progress in implementing preventative strategies in environmental policy and management.

39. To further encourage widespread adoption of the cleaner production approach, the international community could consider adopting a goal for resource productivity. The recommended target is that factor 4 is to be achieved between 2020 to 2030 and factor 10 by 2050. If currently available, cleaner technologies were widely applied, improvements in the order of factor 4 could be reached by the year 2020-2030.

40. In this era of globalization, it is clear that the imperatives of environmental sustainability must be carefully balanced with the requirements of an open world trade system. Currently, there is a widespread lack of integration of environmental objectives with economic and trade objectives. With an increasing trend towards trade liberalization, there is the possibility that some environmental problems could become worse in the absence of appropriate domestic controls. Full appreciation of the environmental issues associated with the globalization of international trade has not been reached.

41. In addition, price reforms which begin to internalize the environmental costs of economic activities are critical if a more sustainable use of natural resources is to be achieved. Current market distortions too often encourage short-term, wasteful and destructive consumption patterns. The international community should therefore examine the environmental impacts of taxes and subsidies.

42. Development aid designated for environmental purposes has often been directed at pollution control projects, although many international institutions are becoming more interested in preventative activities. In addition, other aid programmes do not always take into account the environmental dimension. Aid and lending institutions should thus be further encouraged to make cleaner production investments possible.

43. There is an increasing trend to shift from public towards private-sector investment in developing countries and economies in transition, and since national Governments can only provide a fraction of the necessary development aid, there is a real risk that vital investment projects may not be undertaken because they may not appear to be the most profitable short-term option. Financiers and private bankers therefore have a crucial role to play in incorporating the environmental dimension into their investment projects. In addition, recent negotiations by OECD to negotiate a multilateral agreement on investment should fully recognize the importance of environmental concerns.

44. International, regional and multilateral environmental agreements refer increasingly to prevention and/or efficiency activities to mitigate global environmental problems. Some international conventions, in particular the Montreal Protocol on Substances that Deplete the Ozone Layer, have made provisions for information clearing house functions. Under the multilateral fund established under the Montreal Protocol, for example, UNEP was given the responsibility for gathering information, holding workshops and training courses, networking, conducting country programmes and acting as an information clearing house. This UNEP programme has been instrumental in building the capacity and raising awareness among business, industry and Governments of the economic and performance benefits to be realized through compliance with the Montreal Protocol. This experience could serve as a useful model to be replicated under other international agreements with a view to promoting an integrated response to the variety of environmental challenges addressed under these agreements.

Notes

[1] See World Business Council for Sustainable Development and International Institute for Environment and Development, *A Changing Future for Paper* (London, 1996).